

Foreign direct investment in countries with weak institutions

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Abstract

The FDI behavior of a MNE facing a weak institutional environment in the host country is analyzed. Red tape can be strategically reduced by corruption centralization through informal self enforcing implicit contracts that cannot be enforced legally. The MNE trades the improvement of the institutional environment for a reduction in competition by the government. Rent shifting is possible through an incentive compatible FDI scheme which is robust to repeated interactions in a dynamic relationship when the corruption is stable. Improvement in bureaucratic behavior can benefit the country through an increase of the consumer surplus due to a fall of the marginal cost of the MNE. Centralization of corruption appears thus as a first step in the route of economic growth of countries with weak institutions.

Keywords: FDI, investment liberalization, corruption, institutions.

Classification JEL: F0, F1, O1.

1 Introduction

Among the key factors of economic growth in developing countries, the level of foreign direct investment (FDI) and the quality of institutions¹ play an important role. On one hand, FDI is usually identified as a vector of technology transfer improving total factor productivity through spillovers. On the other hand, as shown empirically by Mauro (1995), effective institutions free of corruption act as a property rights securing device insuring foreigners against the

¹An institution can be viewed as an element of the social structures of a country which has been instituted by law or customs. The quality of an institution is high (resp. weak) if the difference between the value of its assigned outcome and its cost is high (low).

risk of expropriation. The two factors go hand in hand and usually FDI is fostered by the effectiveness of institutions. In this paper, we analyze both the FDI strategy of a multinational enterprise (MNE) seeking to invest in a developing country whose institutions are weak and the effect of FDI on the institutional quality of this country.

From a strict economic viewpoint, the major role played by capital accumulation on economic growth is well known in a context of market globalization. While in a closed economy, capital increases through saving, openness allows countries to use investment resources from abroad either through foreign direct investment or loans contracted on international financial markets or institutions. In an open world economy, financial resources flow internationally from one place to another according to their expected return and production factors should witness their marginal returns equalize: Consistent with a standard reasoning, capital should flow from rich countries, in which labor is scarce relatively to capital, to poor countries. Lucas (1990) points out that this doesn't happen and capital continue to be accumulated by rich countries where it is already abundant.

If Lucas' work explains well the paradox why capital continues to concentrate in already relatively abundant places, (positive externalities due to the existing stock of human capital), the reasons why investment remains so scarce in labor abundant countries, i.e., low income developing countries, remain unclear. By invoking already low capital labor ratios in less developed countries under West Europe colonies, Lucas dismisses the possibility of expropriation in poor countries as a risk premium factor lowering the expected return to capital and acting in the opposite effect of human capital externalities of rich countries.

The Lucas's paradox has generated a wide literature. After reviewing the various explanations of the Lucas' paradox, Reinhardt and Rogoff (2004) show empirically that the main factor of the low paucity of rich to poor countries financial flows is given by the credit risks due to non repayment of debt: Many poor countries that were in default on their debt have difficulties to borrow from the rest of the world. Moreover, low effectiveness of credit markets and financial institutions in these countries inhibits entrepreneurs to use self-finance.

The correlation between private external debt per capita and per capita income, highlighted by Reinhardt and Rogoff (2004), corroborates the hypothesis that per capita income increases when the quality of institutions improves, implying better conditions for borrowing from abroad.

Even if the efficiency with which production factors are differently used explains different per capita capital levels across countries, one cannot refrain from opening the black box of the Solow residual or, in other words, the composition of the total factor productivity (TFP) as shown by the developing accounting approach used by Caselli (2005) and Caselli and Feyer (2008). But the phenomenon of TFP differences remains the favorite candidate for an explication of the Lucas paradox as it is shown in the empirical investigation of Gorinchas and Jeanne (2007). And within a specific country, the TFP variable encompasses the institutional environment: improvements of institutions - in the sense of North (1990) - will foster TFP.²

The capital scarcity problem in labor abundant poor countries is moreover exacerbated by the limited ability of public international organizations in helping them to foster economic growth as shown by Easterly (2003): The effectiveness of foreign public aid is improved by effective host country institutions, but poor countries are poor because they have bad institutions, so foreign aid is inherently of low effectiveness. Capital scarcity and low effectiveness of institutions go thus hand in hand and a good analysis of one phenomenon needs to take the other into account.

The failure of the public action in helping developing countries to reduce the financial gap between saving and investment on a durable basis calls for an analysis of the incentives of private agents to locate their capital in these countries. Foreign direct investment of MNEs constitutes one of the channels by which developing countries reduce their capital scarcity problem. From a Reinhardt and Rogoff viewpoint, if capital scarcity is determined by the risk premium associated with the weak quality of institutions of host countries, an improvement of institutions quality would thus increase the real return of

²This viewpoint is corroborated by the empirical study of Alfaro L., S. Kalemli-Ozcan and V. Volosovych, (2004) which shows that, during the 1970-2000 period, low institutional quality is the leading explanation of the Lucas'paradox.

capital boosting its inflow in less developed countries.³

And given that institutions are supposed to work better if they are better financed, an increase of capital inflow would thus improve the quality of institutions. The increase of FDI and the improvement of institutions quality work thus hand in hand and needs to be analyzed in a concomitant manner.

In this aim, we address the problem of the effect of foreign direct investment on a host country institutions through a framework in which incentives of a multinational firm and a host country government are modeled. For the sake of conciseness, we leave aside the study of the motivation bringing the MNE⁴ to invest in the country as well as the local financial environment under which the firm is operating⁵. We simply assume that the MNE knows that there exists a profit opportunity in producing in the host country for some given *strategic* reasons (e.g; presence of inputs non available elsewhere and lusted after by oligopolistic rivals). The economic environment is hostile because the institutions in the host country are weak: The MNE faces a corrupted bureaucratic hierarchy that can tax the wealth brought or produced. In order to remain clear, we use a narrow definition of weakness: The weaker the institutions the more pervasive the corruption, the less easily can the contracts be legally enforced costlessly without bribes⁶, and the high the marginal cost of production within the host country. It is possible for the MNE to give a stake in the FDI project to the host country government in exchange of a better functioning of the institutions⁷. This agreement has to be self enforcing because it

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⁴See, e.g., Markusen and Maskus (1999) for a synthesis of these elements.

⁵Effective financial institutions are important for local entrepreneurs (Levine, 1998) but MNE have other financial borrowing sources.

⁶The World Bank calculated that in Indonesia it takes an average of 151 days to complete all the paperwork required to start a company, against 30 in Malaysia and eight in Singapore. The relevant permits cost 131% of Indonesia's average annual income per head, compared with 20% in the Philippines and 7% in Thailand. Other procedures are equally expensive and time-consuming. Registering a property in Indonesia will set you back 11% of its value, against 5.5% in Vietnam and 2% in Hong Kong. Collecting money from a recalcitrant debtor takes an average of 570 days in Indonesia, but only 241 in China. And these measures assume that all the official deadlines will be met and no one will ask for bribes which in Indonesia is highly improbable.

⁷Rose-Ackerman (1999) distinguishes two kinds of corruption within a bureaucratic hierarchy: *bottom-up* and *top-down*. Low-level bureaucrats collect bribes for their superior and

cannot be enforced costlessly by any court.

The subject of our paper is close to Thomas and Worrall (1994) who analyze, under different assumptions, the relationship between a foreign investor and a host government under a risk of expropriation. Their results are based on the assumption that the host country can expropriate at its benefit the investment made by the firm. The fact that, in poor countries, skilled labor is vital for keeping in operation a plant with modern technologies, expropriation of physical capital by the host government, even if it were possible, can hardly be profitable: By leaving the host country, the firm keeps its intangible assets needed to produce wealth. Taking into account these elements, we consider the problem through a different angle: The host country bureaucracy leaves the MNE the right to operate in the country in order to extort rents through bribes.

The MNE faces two problems: First, it wants the host government to limit the access to the country to oligopolistic rivals in order to benefit from profit shifting *la Brander Spencer*. Second, the MNE seeks to avoid its profit from being jeopardized by bribes asked by the bureaucracy which represents the institutions. The bureaucracy has a hierarchy structure with at its head, the government top representatives. The weak functioning of institutions is modeled as a *bribing pressure* of the bureaucratic hierarchy carried by the red tape burden: At each level of the bureaucracy, civil servants are able to ask bribes to private agents in order to leave them operating in the country. View from this angle, the MNE doesn't risk total expropriation but is exposed to an increase of its marginal cost of operation due to the regulatory burden imposed by the bureaucratic hierarchy which is seeking bribes. The head of the bureaucratic hierarchy (the top bureaucrat) owns a private information about the bribing pressure of the whole hierarchy and is able to reduce this pressure at all its levels. Such a reduction results in an improvement of the effectiveness of institutions.

In countries with weak institutions, many examples show that government restrictions allow bureaucrats to use the regulatory burden to extort bribes

themselves in a bottom-up regime. Top bureaucrats afford the silence of their subordinates in top-down regime.

from private agents. As pointed out by Mookherjee and P'ng (1995) corruption could be easily wiped out by suppressing regulation and enforcement of regulation provisions. This would however imply a social cost given that regulation provisions are designed to improve resources allocation (e.g. pollution reduction). The issue is thus the trade-off between three elements: The cost of corruption, the benefit of the regulation and the cost of its enforcement. Civil servants or bureaucrats who have to enforce regulation can ask bribes and the prospect of a bribe encourages the civil servant to enforce the regulation. The bribe itself represents thus a price for the effect of the regulation albeit this money stays in the pocket of the agent and doesn't go to the government. Changes in the civil servant's compensation policy affects the strategic interaction between the private firms and them, and hence the effectiveness of the institution. If initially, bribery is profitable, reducing the wage of the civil servant will reduce her incentive for effectiveness. The reduction in effectiveness which increases the red tape cost. The result will be more red tape. Paying bribes to the civil servant allows the private firm to increase its profit through a reduction of its cost of production.

Because regulation can be sold for bribes in countries with weak institutions, the MNE is eager to spend a part of the FDI to incite the top bureaucrat to leave it a special access through the reduction of the bribing pressure of bureaucratic hierarchy. The top bureaucrat is acting on the behalf of the MNE vis--vis the whole bureaucratic hierarchy. Because of incompleteness of information, the interaction between the MNE and the host country government is of a principal-agent nature and is modeled as a incomplete information non zero-sum game. The sum of the game is the profit of the MNE shifted from foreign competitors: The exclusive access granted from the top bureaucrat and the improvement of the host country institutions effectiveness.

The equilibrium of the game shows that the level of FDI is determined by the extent of the rent shifting effects *à la Brander and Spencer*. Vis--vis the MNE, the improvement of institutions (reduction of red tape) is paid by bribing the top-bureaucrat. But because the top-bureaucrat owns an information advantage about the structure of the bribe demand in the lower levels of the bureaucracy and because the MNE cannot by-pass the top bureaucrat to entry the

market, it has to use an incentive compatible FDI scheme. this type of incentive compatible FDI will generate two opposite effects. An allocation effect: because corruption is centralized from the bottom to the top, the bureaucratic hierarchy is more effective⁸. A competition effect: the MNE will be eager to invest only if an oligopolistic rent shifting effect emerges due to a raising rival cost strategy through the corruption of the top-bureaucrat. The net effect will depend on two elements: the size of the marginal cost reduction and the variation of price in the market (and the shape of the host country consumer demand). A marginal cost decrease can imply a lower oligopolistic market price. In this case, the increase in the consumer surplus outweighs the increase of the oligopolistic profit of the MNE.

From a dynamic viewpoint, the MNE can try to use its lower level bureaucrats network relationship building to bypass the top-bureaucrat but this is not in its interest: the rent shifting effect could be jeopardized if the top-bureaucrat modifies the country access in favor of another foreign MNE. Following Bardhan (1997), market access can only be rented and cannot be bought.

Thus, starting from a point where corruption is widened because decentralized, but where profits are possible, a private improvement of the resource allocation within the bureaucracy through centralization can benefit the consumers by increasing their surplus and finally their wealth. This provides an argument for the improvement of weak institutions through centralization of corruption. One can find a reason why corrupted but centralized regimes have met a sustained rate of growth in their economy.

The paper is organized as follows. In the first section, we define the concept of quality of institutions and analyze its qualitative link with investment and economic growth. In the second section, we analyze the FDI strategy of a MNE seeking to invest in a country whose institutions are weak. In a dynamic framework, the fourth section investigates the behavior of the host country government facing the trade-off which results from the choice of inducing the firm to stay in the country or to induce its exit by expropriating it. A final

⁸The work of Waller and alii (2002) provides an analysis of the improvement institution effectiveness due to corruption centralization: centralization reduces both the total amount of corruption and the size of the informal sector in the economy.

section is devoted to concluding remarks.

2 FDI and the quality of institutions

When institutions are weak, the legal system doesn't work effectively. In this case, the regulatory burden in the hands of bureaucrats acts as a rent seeking device working through red tape and other harassment tools as pointed out by Krueger (1974). Once triggered, the inefficiency of institutions is self maintained and it results in a loss of welfare due to bad incentives: agents are more incited to look for rents than to contribute in the production of wealth in the economy. In this context, corruption is a central element of the regulatory burden for bureaucrats who are collecting bribes (it is a rent collecting device) and producers or consumers who are paying bribes (it is a tool to circumscribe or bypass the regulatory burden).

The economic effects of corruption under weak institutions are subject to controversies. Political scientists – eg., Leff (1964) – have argued that one can find some virtues in corruption which, in a bad institutional situation, can be viewed as “grease money” speeding up the wheels of commerce. Kaufmann and Wei (1999) show that if this assertion can be true in a partial and static equilibrium framework, it doesn't hold in a general equilibrium and a dynamic viewpoint. Inefficiency (due to regulatory red tape for example) and bribery are positively correlated because of a ratchet effect pointed out by Bardhan (1997)⁹: the reduction of present inefficiencies jeopardizes the future bribes. The possibility of improvement of institutions in a context of pervasive corruption remains thus a puzzle because of the endogenous nature of the correlation: in the short term, weak institutions are more effective with corruption but, in the long term, an effective institution is corruption free.

As shown by Krueger (1974), government restrictions play a fundamental role in the rise of rents. In this perspective, regulatory provisions due to government interventions are usually associated with restrictions of competition, source of rents. In the case of FDI liberalization, an increase of competition means that bureaucracies reduce their power to regulate and thus loose their

⁹Bardhan mentions that it used to be said that General Noriega of Panama, in his heyday, could not be *bought* but only be *rented*.

control rights over rent allocation. One can find here a reason why the negotiations on investment liberalization launched under the auspices of OECD have failed at the end of the 90's¹⁰.

The institutional quality of a country is thus primarily a measure of the property rights enforcement by bureaucrats: if the red tape burden (laws) has to be lightened with bribes then the legal environment serves as a rent extraction device. A country can thus have a lot of laws but this does not prefigure its institutional quality.

In the case of FDI, two levels of restrictions have to be taken into account: first, restrictions over the entry of the MNE: This is decided through an agreement between the MNE and the top bureaucrats. Second, once the investment is made, the MNE has to operate within the country and can face the regulatory burden of the entire bureaucratic hierarchy. The MNE has thus to be sure about what will be the conditions of operations within the country when negotiating its entry with the top bureaucrat and an hold-up problem rises at this stage. This hold-up can be solved by an incentive compatible FDI which consists of an implicit contract (self-enforcing contract) between the MNE and the top bureaucrat. The incentive compatible FDI consists of a couple (F, c) where F is the part of the FDI left to the top bureaucrat in order to be sure to operate at marginal cost c .

In our approach, we use this narrow definition of the institutional quality we say that the institutional context is improved when initial property rights over wealth brought (or surplus generated) by foreign economic agents through FDI at date t are not jeopardized by the host country bureaucratic system at date $t + i$ with $i \in 1, \dots, \infty$. Moreover we assume that property rights are not enforced when expropriation occurs through extortion inducing the MNE to leave the country as it was the case, for example, in Indonesia (The Economist, 2004)¹¹. Partial extortion through happens when the marginal cost of the MNE is increased by the regulatory burden. The MNE can decide to

¹⁰See Henderson (1999) for a detailed analysis of the failure of Multilateral Agreement on Investment (MAI) in the mid 90's.

¹¹In 2002, Indonesia was the only country in South-East Asia to record a net outflow of foreign direct investment (of \$1.7 billion) because of, among other factors such as e.g. bad utilities, the lack of a legal system capable of passing good laws and enforcing them.

leave the country if it incurs losses. In this case, the MNE loses the sunk FDI spent in the host country at its entry.

2.1 Foreign country access with corruption pressure

A multinational enterprise decides to build a plant in a foreign country whose institutional environment is weak, i.e. within which property rights on wealth brought (FDI expenses) or produced (profits) can be jeopardized by a bureaucratic hierarchy using red tape in order to get bribes. Following the work of Waller and *alii* (2002), we assume that the foreign bureaucracy is represented by a top bureaucrat (TB). The MNE has to face a pervasive corruption at all the level of the bureaucratic hierarchy, increasing its marginal cost of production and jeopardizing its profit.

The MNE is in oligopolistic competition with another MNE in getting an access to the country. The TB knows this and is willing to restrict the access to the country to get rents from the MNEs. The MNEs are thus "bidding" to get a special country access for the selected candidate. This special market access consists of a minimal red tape burden imposed by the bureaucratic hierarchy. Consistent with the motives of restriction, it is not in the interest of the TB to offer a fair competition to all MNE: this will erase the opportunities to get rents. The MNE selected for a special country access can reduce the red tape burden (i.e. the corruption pressure of the bureaucracy) by paying a lump-sum bribe to the TB who is redistributing a part of it to bureaucrats of lower levels. The lump-sum bribe is constituted by a part of the FDI expense. The expense allows the MNE to reduce its marginal cost of operating in the country, and gives her a strategic advantage against her foreign rivals in the spirit of Brander and Spencer (1985): the more is paid to the TB the less the marginal cost relative to foreign competitors.

The TB owns a private information about the red tape burden imposed by the bureaucratic hierarchy (i.e., the corruption pressure). Because the true level of the marginal cost (including red tape costs) can only be checked after the bribe has been redistributed to the bureaucratic hierarchy, the MNE faces a moral hazard problem in its relationship with the TB. It can exaggerate the corruption pressure of the bureaucratic hierarchy, in order to increase the part

of FDI constituting the bribe paid by the MNE to reduce the red tape costs. The weak institutional environment makes this possible: business contracts cannot be enforced efficiently through coercive provisions backed on legal rules. The relationship between the MNE and the TB takes thus the form of an informal contract between a principal (the MNE) and an agent (the TB) in which the reduction of the red tape burden is exchanged against a part of FDI expense used to reduce the corruption pressure of the bureaucratic hierarchy.

From a static viewpoint, the interaction between the MNE, its foreign competitor and the TB is formalized by a two-stage game in incomplete information: the agreement between the TB and the MNE over the FDI level is concluded in the first stage; the oligopolistic competition between the MNE and its foreign rival takes place in the second stage. For the MNE and its foreign competitor, payoffs are given by the profits net of sunk costs of FDI (i.e. net of the lump-sum bribe paid to the TB). The payoff of the TB is given by the difference between the part of FDI received from the MNE and the bribes used to reduce the corruption pressure of the bureaucratic hierarchy.

In order to characterize the Bayesian equilibrium as a solution of this game, we first compute the second stage equilibrium of the oligopolistic interaction opposing the MNE and its foreign competitor. Using a backward induction methodology, we incorporate the profits in the first stage MNE payoff in order to compute the FDI equilibrium strategy of the whole game.

2.1.1 Oligopolistic competition

Suppose that a MNE and its oligopolistic competitor are in competition to access a foreign country. Firms interact in a Cournot duopoly during one period and the MNEs incur a direct investment level I used to build a plant. The MNE can decide to pay a share λ of I in exchange of a special access to the country, which consists of an exclusive reduction of the red tape burden incurred when operating in the country. This net reduction r gives a strategic advantage to the MNE at its marginal cost level in the Cournot game and allows her to shift profits from its competitor, in the spirit of Brander and Spencer (1985)¹². The

¹²The access can be viewed as a binding process in which each firm submit an amount $\lambda \cdot I$ to obtain a profit π . The country access allocation by the TB resemble a procurement as in Beck and Maher (1986) in which bribery and competitive bidding are interchangeable from a supply

MNE entering the new country is unable to monitor exactly which marginal cost reduction r can be obtained. It only observes an *ex-post* value of marginal cost of production in the country. The marginal cost reduction includes the reduction of the red tape cost. For this reduction, the TB gets a share λ of the FDI amount I used to compensate the bureaucratic hierarchy which controls the red tape cost. If the MNE decide to retire from the foreign country it recovers only $(1 - \lambda) \cdot I$ from its direct investment. In other words, a sunk cost equaling $\lambda \cdot I$ is incurred by MNE to obtain an exclusive reduction of the red tape burden.

The TB is selfishly interested by the bribe collected from the MNE but can also be concerned about the positive economic effect of FDI. This effect is modeled by a parameter α in the utility of the TB which can be written:

$$u = \lambda \cdot I + \alpha \cdot I - K(r) \quad (1)$$

where $\lambda \cdot I$ is the bribe obtained from the MNE and $K(r)$ is the cost of reducing the red tape burden imposed by the bureaucratic hierarchy. r denotes the strategic¹³ reduction of ϵ , the operating marginal cost of the firm, the ex-post marginal cost being: $c = \epsilon - r$.

Because negotiations are only informal, the MNE cannot observe the reduction r nor ϵ the value of its ex-ante marginal cost (without any reduction due to corruption). The firm can only check the final marginal cost when effectively operating in the market i.e. when FDI and corruption of the TB are made. In other words, the MNE cannot disentangle the realized ex-post marginal cost c from its ex-ante reduction r . The game opposing the MNE to the TB depicts a moral hazard problem (reduction by the TB of the MNE marginal cost) due to an adverse selection problem (bad information owned by the MNE about what will be the marginal cost with or without corruption when operating in the host market). If the firm were able to know exactly ϵ , it would have been possible for her to deduce r through the observation of the final value c . In this case of perfect information, the profits of the MNE and its competitor (denoted

side efficiency viewpoint. Modeling the selection of the MNE by the TB, even if possible, will thus not change the main result linking strategic cost reduction through country special access.

¹³In the sense of Brander and Spencer (1985).

with $*$) are given by:

$$\begin{aligned}\pi(x, y, r) &= x \cdot p(x + y) - C(x, r, \epsilon) \\ &= x \cdot p(x + y) - (\epsilon - r) \cdot x - I(r) + (1 - \lambda) \cdot I(r)\end{aligned}\quad (2)$$

$$\pi^*(x, y, r) = y \cdot p(x + y) - c^* \cdot y \quad (3)$$

By computing the Cournot Nash equilibrium, we can establish the following lemma:

Lemma 1 *With complete information, exclusive reduction in external corruption pressure allows the MNE to shift rents from foreign competitors.*

Proof. Standard total differentiation of first order conditions of profit maximization $\pi_x(x, y, r)$ and $\pi_y^*(x, y, r)$, shows under and classical Hahn stability conditions that the MNE benefits from the strategic effect of r :

$$\frac{dx}{dr} = -\frac{\pi_{yy}^*}{\Delta} > 0 \quad \text{and} \quad \frac{dy}{dr} = \frac{\pi_{yx}^*}{\Delta} < 0 \quad (4)$$

■

2.1.2 Incentive compatible FDI

The MNE spends the amount I (in which $\lambda \cdot I$ is sunk) to access the local market. The value of λ represents the share of FDI which goes directly in the pocket of the TB. $(1 - \lambda)$ reflects its preferences on the economic effects in the country of FDI such as positive externalities. Because the ex-ante marginal cost ϵ is imperfectly known before FDI, the game opposing the MNE to the TB is of incomplete information and static nature, a Bayesian game, whose timing is the following:

- 1) The TB asks for a bribe in the form of a part $\lambda \cdot I$ of the FDI expenditure I to the MNE, in order to reduce the corruption pressure of the bureaucratic hierarchy associated with the red tape burden imposed to MNEs operating in the country.
- 2) The MNE offers to the TB an informal contract which consists of a couple $[\lambda \cdot I(\tilde{\epsilon}), c(\tilde{\epsilon})]$ that links a value of the bribe $\lambda \cdot I(\tilde{\epsilon})$ to a value of an announced final marginal cost $c(\tilde{\epsilon}) = \tilde{\epsilon} - r(\tilde{\epsilon})$. The real final marginal cost $c(\tilde{\epsilon})$ can only be observed when market access has occurred.

3) The true ex-ante marginal cost ϵ (including the cost of the non-reduced red tape burden) is privately known by the TB who reports $\tilde{\epsilon}$ when choosing $[\lambda \cdot I(\tilde{\epsilon}), c(\tilde{\epsilon})]$. From a game modeling viewpoint, ϵ is stochastic and drawn at the beginning of the game according to a distribution $G(\epsilon)$ (on a range $[\epsilon^-, \epsilon^+]$) known by both the TB and the firm. After learning the value of ϵ , the TB, by picking a bribe $[\lambda \cdot I(\tilde{\epsilon})]$ among the propositions made by the MNE, commits on a value $c(\tilde{\epsilon})$, that is, both an ex-ante marginal cost $\tilde{\epsilon}$ and a effort $r(\tilde{\epsilon})$ in bribing the bureaucratic hierarchy at a cost $K(r(\tilde{\epsilon}))$. The announced ex-post marginal cost of operating on the local market $c(\tilde{\epsilon}) = \tilde{\epsilon} - r(\tilde{\epsilon})$ is known by both the MNE and its oligopolistic rival at this stage of the relationship.

4) The market is supplied by the two firms which interact in a Cournot oligopolistic competition and get their payoffs.

When the information between the MNE and the TB is symmetric, the MNE can observe all the variables required to implement its FDI strategy. However, in an asymmetric information context, the MNE is unable to know the corruption pressure of the bureaucratic hierarchy in the local market and thus the actual ex-ante marginal cost ϵ .

Problems of adverse selection and moral hazard emerge: During the negotiation to access the local market, the TB can hide informations about the corruption pressure in order to justify more costly bribing activities than necessary, and keep for himself the unused amount of the bribing payment. The TB can also simultaneously sell the access to the rival MNE inducing the rent shifting effect due to the marginal cost difference to vanish. By this way, the TB earns an informational rent which is given by the difference between the cost $K(r(\cdot))$ of reducing the red tape burden and $\lambda \cdot I(\cdot)$, the share of FDI obtained from the MNE.

The TB can also be interested by the positive externalities of FDI such as technological spillovers. These preferences are introduced in the TB's utility function B by a weight α on the FDI expense I . The value of B can thus be written as the sum, on one hand, of the bribe $\lambda \cdot I$ minus the cost K of the reduction of the bureaucratic hierarchy corruption pressure and, on the other

hand, of $\alpha \cdot I$, the economic benefit of FDI :

$$B = \lambda \cdot I - K(r) + \alpha \cdot I = (\alpha + \lambda) \cdot I - K(r) \quad (5)$$

From the MNE viewpoint, the share $\lambda \cdot I$ is sunk. The value its objective function Π is thus given by:

$$\Pi = \pi - I + (1 - \lambda) \cdot I = \pi - \lambda \cdot I \quad (6)$$

By combining (5) in (6), the MNE objective function becomes:

$$\Pi = \pi - \frac{\lambda}{\alpha + \lambda} \cdot (B + K(r)) \quad (7)$$

The second term in the RHS of (7) shows that, from the MNE viewpoint, when the TB finds the FDI very useful for its economic effects (i.e. when α is large compared with λ) relatively to corruption payments, the objective function of the MNE is less sensitive to the level of FDI. From the MNE viewpoint, FDI expenses are costly only if, from the TB viewpoint, corruption payments are preferred to economic benefits. In other words, under special market access, the MNE will agree to increase its FDI level only if it can exchange it with an extra profit due to strategic rent shifting.

The TB's rent $B(\epsilon)$ can be written as follows:

$$B(\epsilon) = (\alpha + \lambda) \cdot I(\epsilon) - K(r(\epsilon)) \quad (8)$$

$K(r(\epsilon))$ is the bribing expenditure aimed at reducing the marginal cost of operating ϵ in order to supply the good at the marginal cost $c = \epsilon - r$. The bribing expenditure is assumed to be an increasing and convex function of the red tape reduction effort :

$$K(0) = 0, K_r > 0, K_{rr} > 0, K_{rrr} > 0 \quad (9)$$

In starting the negotiation with the MNE, the TB announces a corruption pressure $\tilde{\epsilon}$ while the real value is ϵ . The cost of reducing this operating cost of the amount r is given by $K(r(\tilde{\epsilon}), \epsilon)$.

We have $K(r(\tilde{\epsilon}), \epsilon) > K(r(\epsilon), \epsilon)$ ¹⁴ for $\tilde{\epsilon} > \epsilon$ because $r(\tilde{\epsilon}) > r(\epsilon)$ for a given final marginal cost $c = \epsilon - r(\epsilon)$. In this case, the TB's informational rent when

¹⁴If $c = \epsilon - r$ and $\tilde{\epsilon} > \epsilon$ then $r(\tilde{\epsilon}) = \tilde{\epsilon} - c > r(\epsilon) = \epsilon - c$ and $K(r(\tilde{\epsilon}), \epsilon) = K(\tilde{\epsilon} - c) > K(r(\epsilon), \epsilon) = K(\epsilon - c)$.

announcing a corruption pressure equal to $\tilde{\epsilon}$ while the real pressure equals ϵ is given by:

$$B(\tilde{\epsilon}, \epsilon) = (\alpha + \lambda) \cdot I(\tilde{\epsilon}) - K(r(\tilde{\epsilon}), \epsilon) \quad (10)$$

Because of this information asymmetry, the MNE faces a double problem: it has to build an informal contract that elicits the truth from the TB without loosing its participation in the deal. The MNE has to anticipate the TB strategies, to select the optimal ones from its viewpoint and to incorporate them into the design of its own strategies to maximize its profit. According to the Revelation Principle¹⁵, the first constraint consists of obtaining the truth about the bureaucratic hierarchy corruption pressure: The MNE wants the TB to choose a truthtelling strategy at the equilibrium of the game¹⁶.

Lemma 2 *An incentive compatible FDI requires the top bureaucrat's rent has to be a decreasing function of the corruption pressure of the bureaucratic hierarchy.*

Proof. In order to select these strategies, the MNE has to built a revelation mechanism that verifies the incentive compatibility condition IC:

$$B(\epsilon, \epsilon) \geq B(\tilde{\epsilon}, \epsilon) \quad \forall (\tilde{\epsilon}, \epsilon) \in [\epsilon^-; \epsilon^+] \times [\epsilon^-; \epsilon^+] \quad (IC) \quad (11)$$

By applying the Revelation Principle to *IC*, and using the envelop theorem, the first order condition (IC1) and the second order condition (IC2) for incentive compatibility of the revelation mechanism can be written as follows (see appendix A1 for technical details)

$$\frac{dB(\epsilon)}{d\epsilon} = -K'(r(\epsilon)) < 0 \quad (IC1) \quad (12)$$

$$\frac{dr(\epsilon)}{d\epsilon} < 1 \quad (IC2) \quad (13)$$

The second constraint deals with participation to the informal contract. The TB will accept to deliver the MNE an access to the market only if its reservation

¹⁵The Revelation Principle due to Myerson (1979) (among others), states that there is no loss of generality in restricting to direct revelation mechanisms in the implementation of the optimal solution.

¹⁶It is the Nash Bayes equilibrium of the game of incomplete information between the TB and the MNE.

utility is non-negative. Formally, this is captured by an individual rationality constraint (*IR*):

$$B(\epsilon) \geq 0 \quad (\text{IR}) \quad (14)$$

Binding (*IR*) for ϵ^+ i.e. $B(\epsilon^+) = 0$ (the TB with the highest demand of corruption will have its reservation utility level normalized to zero) allows us to integrate (*IC*) in order to have a new expression of the TB benefit:

$$B(\epsilon) = \int_{\epsilon}^{\epsilon^+} K'(r(\epsilon)) \cdot d\epsilon \quad (15)$$

■

TK strategies verifying conditions (12), (15) and (14) are incentive compatible and individually rational: They will lead the TB to participate in the informal contract through a truthtelling strategy. In order to maximize its profit at the equilibrium of the game of incomplete information, the MNE has to restrict the choice in these strategies to find the optimal one in designing the informal contract.

2.1.3 Equilibrium

In its FDI strategy, the MNE, by proposing a menu of informal contracts $[c(\epsilon), \lambda \cdot I(\epsilon)]$ seeks to maximize its expected profit $E(\Pi)$ with respect to $c(\epsilon)$ and $\lambda \cdot I(\epsilon)$:

$$E(\Pi) = \int_{\epsilon^-}^{\epsilon^+} [\pi(x(c(\epsilon)), y(c(\epsilon)), c(\epsilon)) - \lambda \cdot I(\epsilon)] \cdot g(\epsilon) \cdot d\epsilon \quad (16)$$

Taking into account the fact that $c(\epsilon) = \epsilon - r(\epsilon)$ and $B(\epsilon) = (\alpha + \lambda) \cdot I(\epsilon) - K(r(\epsilon))$ the objective function of the MNE can formally be expressed by:

$$E(\Pi) = \int_{\epsilon^-}^{\epsilon^+} \left[\pi(x(r(\epsilon)), y(r(\epsilon)), r(\epsilon)) - \frac{\lambda}{\alpha + \lambda} \cdot [B(\epsilon) + K(r(\epsilon))] \right] \cdot g(\epsilon) \cdot d\epsilon \quad (17)$$

The set of the MNE optimal FDI strategies will emerge as the solution of Program (20) in which only TB truth telling strategies are taken into account :

$$\left\{ \begin{array}{ll} \text{Max}_{B(\cdot), r(\cdot)} & \int_{\epsilon^-}^{\epsilon^+} \left[\pi(x(r(\epsilon)), y(r(\epsilon)), r(\epsilon)) - \frac{\lambda}{\alpha + \lambda} \cdot [B(\epsilon) + K(r(\epsilon))] \right] \cdot g(\epsilon) \cdot d\epsilon \\ \text{s.t. :} & \frac{dB(\epsilon)}{d\epsilon} = -K'(r(\epsilon)) \quad (IC_1) \\ & \frac{dr(\epsilon)}{d\epsilon} < 1 \quad (IC_2) \\ & B(\epsilon^+) = 0 \quad (IR) \end{array} \right. \quad (18)$$

The solution of Program (20) allows us to enable the following proposition that summarizes the MNE equilibrium strategy in a static -non repeated- relationship with the foreign country top-bureaucrat:

Proposition 1 *The optimal level of the MNE incentive compatible FDI $I^*(\epsilon)$ spent to access the foreign country under weak institutions is given by:*

$$I(\epsilon) = \frac{1}{\alpha + \lambda} \cdot \left[K(r(\epsilon)) + \int_{\epsilon}^{\epsilon^+} K'(r(\epsilon)) \cdot d\epsilon \right] \quad (19)$$

where the optimal value of the corruption pressure reduction r^* is given by:

$$\left[-\pi_y \cdot \frac{dy}{dr} \right] \cdot g(\epsilon) - \left[-C_r - \frac{\lambda}{\alpha + \lambda} \cdot K_r \right] \cdot g(\epsilon) = \frac{\lambda}{\alpha + \lambda} \cdot G(\epsilon) \cdot \frac{d}{dr} \left[-\frac{dB(\epsilon)}{d\epsilon} \right] \quad (20)$$

Proof. See appendix A9. ■

Proposition 1 describes completely both the MNE and the top bureaucrat behaviors in a static relationship context. Consider first the relationship (??) that gives the level r^* of the bureaucratic hierarchy corruption pressure reduction. The first term on the LHS of (??) represents the expected marginal increase of the MNE profit due to its duopolistic strategic advantage relatively to its rivals. The second term is the expected marginal increase of the global cost of supplying the good in the foreign country. The term on the RHS of (??) is the marginal increase of the TB informational rent $B(\epsilon)$ evaluated at its shadow price $\frac{\lambda}{\alpha + \lambda} \cdot G(\epsilon)$ due to the financing of one more unit of corruption pressure reduction r .

Equality (??) shows that the amount of FDI I^* to access the foreign market is such that, at the margin, the gap between the expected cost and the expected benefit equals the increase of the informational rent evaluated at its shadow price $\frac{\lambda}{\alpha+\lambda} \cdot G(\epsilon)$. This expression is the co-state variable associated with the state equation IC which describes the admissible incentive compatible FDI in the modified MNE objective function (the Hamiltonian). From this point of view, the optimal incentive compatible FDI is such that when the firm invests one more unit in the foreign market with a corruption pressure equal to ϵ , its expected profit is increased of the level $-\pi_y \cdot \frac{dy}{dr} \cdot g(\epsilon)$ but the expected informational rent of the TB is also increased of the amount $\frac{\lambda}{\alpha+\lambda} \cdot G(\epsilon) \cdot \frac{d}{dr} \left[-\frac{dB(\epsilon)}{d\epsilon} \right]$. ($G(\epsilon)$ is the probability that the TB facing a corruption demand ϵ earns a informational rent $B(\epsilon)$).

Under the optimal informal contract, when the corruption demand is the lowest ($\epsilon = \epsilon^-$), the rent shifting effect (due to the strategic advantage over MNE oligopolistic competitors) is optimal (it is the same level that it would prevail under symmetric information) but the informational rent of the TB is also at its maximum. The strategic reduction of the marginal operating cost is at its maximum so that the rent shifting effect is also maximum.

However, the MNE is incited to limit its FDI expense when the marginal operating cost starts to increase. When it is at its highest level (the bribing demand is at its highest level), the informational rent of the TB tends to vanish but the marginal cost reduction r is very far from its complete information level. This is due to the objective of the MNE to find an optimal trade-off between shifting the oligopolistic rent (by increasing the FDI to reduce the red-tape in its favor) and reducing the informational rent (which has no direct effect in reducing the red tape).

The static analysis shows that the TB owns property rights on the access. In the spirit of Krueger (1974), they allow him to benefit from rents due to the sale of the oligopolistic rents to a foreign firm at the expense of local consumers and/or taxpayers. In the case of a continuous interaction, the firm can gather informations about the business environment and exploit these informations against the top bureaucrat. In other words, the firm can be incited to bypass the TB and bribe directly the bureaucratic hierarchy in order to expropriate the

TB from the control of the market access. The TB anticipates this opportunistic behavior and can be reluctant to provide the required effort to reduce the corruption pressure. Inefficiency can thus result from the opportunism of the firm and from its response from the TB. At its turn, the firm is incited to commit not behave opportunistically to avoid an inefficient outcome. However, this commitment will only be credible if it arise as an equilibrium in the continuous relationship, that is, if the commitment strategy will be subgame perfect.

2.2 Repeated foreign direct investment

When the interaction takes place during several periods, the MNE is naturally incited to take into account the effect of its present actions on the present behavior of the top-bureaucrat but also on its future behavior. In other words, the MNE has to take into account future effects of presents actions that is to internalize externalities of present actions on the future environment in which it operates.

In order to examine what outcome will arise in a repeated relationship, the interaction is extended to two periods. To link future effects and present actions, we assume that the MNE commits herself (at the beginning of period 1) to a FDI strategy over the two periods: with commitment and from an two period optimization viewpoint, intertemporal effects are internalized by the MNE at the beginning of the interaction. Even if such a commitment would not be likely to exist in the reality, it appears as a benchmark for the analysis: at the equilibrium, relaxing marginally the commitment constraint allows to identify its shadow price and more generally the incentives of the players to adopt alternative equilibrium strategies under non-commitment.

In a two-period interaction with commitment, a global FDI strategy consists of a set of two single and separate FDI strategies. The global FDI strategy will be globally incentive compatible if it is incentive compatible in the two period as a whole and if each single period FDI strategy is incentive compatible.

The MNE proposes thus a set of two period incentive compatible FDI to the TB at the beginning of period one. The global two period incentive compatible FDI consists of a bundle $\{[\lambda \cdot I_1(\epsilon_1, \epsilon_2), c_1(\epsilon_1, \epsilon_2)], [\lambda \cdot I_2(\epsilon_1, \epsilon_2), c_2(\epsilon_1, \epsilon_2)]\}$. The TB picks the appropriate bundle and the interaction takes place. Once FDI

bundles have been proposed by the MNE and picked by the TB, the deal is binding for each player: the MNE commits not to renege on the agreement and the TB commits not to leave the relationship during the two periods. In order to keep the analysis tractable, we proceed by backward induction. Second period equilibrium strategies are identified first and incorporated in first period interaction in order to define first period equilibrium strategies.

2.2.1 Dynamic incentive compatible FDI

In the first period, the TB observes the corruption pressure ϵ_1 and is doing an effort r_1 to reduce it. At the beginning of the second period, the MNE has checked the final corruption pressure $\tilde{\epsilon}_1$ through the observation of the marginal cost c_1 (reduction effort r_1 is still a private information owned by the TB) and the TB reports $\tilde{\epsilon}_2$ for the period 2. Considering first $\tilde{\epsilon}_1$ as fixed, the second period benefit of the TB is given by¹⁷ :

$$B_2(\tilde{\epsilon}_1, \tilde{\epsilon}_2; \epsilon_2) = (\alpha + \lambda) \cdot I_2(\tilde{\epsilon}_1, \tilde{\epsilon}_2) - K[r_2(\tilde{\epsilon}_1, \tilde{\epsilon}_2), \epsilon_2] \quad (21)$$

For the incentive compatibility constraint to be respected in period 2, we need that:

$$B_2(\tilde{\epsilon}_1, \tilde{\epsilon}_2; \epsilon_2) = B_2(\tilde{\epsilon}_1, \epsilon_2; \epsilon_2) \geq B_2(\tilde{\epsilon}_1, \tilde{\epsilon}_2; \epsilon_2) \quad \forall \epsilon_1, \forall \epsilon_2 \quad (22)$$

With the same methodology used in the static case, the benefit of the TB due to his period 2 private information can be written as:

$$B_2(\tilde{\epsilon}_1; \epsilon_2) = \int_{\epsilon_2^-}^{\epsilon_2^+} K' [r_2(\tilde{\epsilon}_1, x_2), x_2] \cdot dx_2 + B_2(\tilde{\epsilon}_1; \epsilon_2^+) \quad (23)$$

Let $\Omega(\cdot, \cdot)$ denote the TB two period benefit:

$$\Omega(\tilde{\epsilon}_1; \epsilon_1) = B_1(\tilde{\epsilon}_1, \epsilon_1) + \delta \cdot \int_{\epsilon_2^-}^{\epsilon_2^+} B_2(\tilde{\epsilon}_1; \epsilon_2) \cdot g(\epsilon_2 | \epsilon_1) \cdot d\epsilon_2 \quad (24)$$

where δ is the discount factor. Ω is a function of the period 1 pressure which will impact the period 1 benefit B_1 but also the period 2 benefit B_2 through

¹⁷ $B_{t+1}(\tilde{\epsilon}_t, \tilde{\epsilon}_{t+1}; \epsilon_{t+1})$ is the period $t+1$ benefit when $\tilde{\epsilon}_t$ and $\tilde{\epsilon}_{t+1}$ have been announced and while ϵ_{t+1} is the real pressure. Moreover, $r_{t+1}(\tilde{\epsilon}_t, \tilde{\epsilon}_{t+1})$ denotes the period $t+1$ reduction when $\tilde{\epsilon}_t$ and $\tilde{\epsilon}_{t+1}$ have been announced. Finally, $K[r_{t+1}(\tilde{\epsilon}_t, \tilde{\epsilon}_{t+1}), \epsilon_{t+1}]$ denotes the period $t+1$ reduction cost K when $\tilde{\epsilon}_t$ and $\tilde{\epsilon}_{t+1}$ have been announced and while ϵ_{t+1} is the real pressure.

the effect of the information (about the pressure ϵ) obtained in period 2 on the report of the period 2 pressure. This link is formalized by taking into account the expected period 2 benefit with respect to the conditional probability density $g_2(\epsilon_2|\epsilon_1)$ and where B_1 is identical as in the static case:

$$B_1(\tilde{\epsilon}_1, \epsilon_1) = (\alpha + \lambda) \cdot I_1(\tilde{\epsilon}_1) - K[r_1(\tilde{\epsilon}_1), \epsilon_1] \quad (25)$$

In expression (24), the expected value of B_2 can be re-written using an integration by part¹⁸:

$$\int_{\epsilon_2^-}^{\epsilon_2^+} B_2(\tilde{\epsilon}_1; \epsilon_2) \cdot g_2(\epsilon_2|\epsilon_1) \cdot d\epsilon_2 = - \int_{\epsilon_2^-}^{\epsilon_2^+} G_2(\epsilon_2|\epsilon_1) \cdot dB_2 \quad (26)$$

so that the TB two period benefit can be re-written as follows:

$$\begin{aligned} \Omega(\tilde{\epsilon}_1; \epsilon_1) = & (\alpha + \lambda) \cdot I_1(\tilde{\epsilon}_1) - K(r_1(\tilde{\epsilon}_1), \epsilon_1) + \\ & \delta \cdot \int_{\epsilon_2^-}^{\epsilon_2^+} K'(r_2(\tilde{\epsilon}_1, \epsilon_2)) \cdot G_2(\epsilon_2|\epsilon_1) \cdot d\epsilon_2 \end{aligned} \quad (27)$$

Assume that an increase of ϵ_1 increases the probability that $\epsilon_2 > \epsilon_1$ so that $G_2(\epsilon_2|\epsilon_1)$ is a decreasing function of ϵ_1 . Given that the period 2 FDI is incentive compatible, conditions under which the two period incentive compatibility of FDI are verified are given by the following lemma:

Lemma 3 *A dynamic incentive compatible FDI with commitment over two periods requires that the TB's two period benefit has to be a decreasing function of:*

- i) the period 1 corruption pressure;
- ii) the period 2 corruption pressure if the period 1 and 2 corruption pressures are correlated;
- iii) the corruption pressure correlation;
- iv) the preference for the future.

Proof. The two period FDI policy is incentive compatible if:

$$\Omega(\epsilon_1) = \Omega(\epsilon_1; \epsilon_1) \geq \Omega(\tilde{\epsilon}_1; \epsilon_1) \quad (28)$$

¹⁸Using the fact that $B_2(\tilde{\epsilon}_2; \epsilon_2^+) = G_2(\tilde{\epsilon}_2; \epsilon_2^-) = 0$

After treatment, this condition can be re-written as (see Appendix 1.2 for details):

$$\frac{d\Omega(\epsilon_1)}{d\epsilon_1} = -K'(r_1(\epsilon_1)) + \delta \cdot \int_{\epsilon_2^-}^{\epsilon_2^+} K'(r_2(\epsilon_1, \epsilon_2)) \cdot \frac{\partial G_2(\epsilon_2 | \epsilon_1)}{\partial \epsilon_1} \cdot d\epsilon_2 \quad (29)$$

■

Lemma 4 *A MNE commitment on a two period FDI policy requires inter-period transfers of TB benefits in order to internalize intertemporal externalities of information revelation. Specifically inter-period transfers depend on intertemporal corruption pressures correlation and are a decreasing function of the corruption pressure correlation.*

Proof. By integrating this condition, we get the TB benefit $\Omega(\epsilon_1)$:

$$\Omega(\epsilon_1) = \int_{\epsilon_1^-}^{\epsilon_1^+} \left[K'(r_1(x_1)) - \delta \cdot \int_{\epsilon_2^-}^{\epsilon_2^+} K(r_2(x_1, \epsilon_2)) \cdot \frac{\partial G_2(\epsilon_2 | x_1)}{\partial \epsilon_1} \cdot d\epsilon_2 \right] \cdot dx_1 \quad (30)$$

■

2.2.2 Dynamic optimal FDI strategy

Proposition 2 *Given that the commitment of the MNE implies intertemporal transfers of TB's benefits, a self enforcing implicit contract cannot internalize intertemporal externalities of information revelation unless corruption pressures are stationary over time intertemporal transfers are needless.*

Proof. Under non-stationnary corruption pressures, a dynamic FDI stragy based on a commitment at the beginning of the first period is not self-enforceable:

- i) if the MNE commits not to behave opportunistically in order to incitivize the TB in the second period, no benefit is paid for the second period to the TB: the TB would not be agree to abandon its control rights in exchange of non-opportunistic behavior of the MNE.
- ii) if the MNE does not commit not to behave opportunistically, the only way to incitivize the TB for the second period is to pay him its second period benefit in the first period: the TB is incited to minimize the second period corruption pressure and to leave the relationship after the first period. ■

Assume that:

$$\begin{aligned}\Pi_1 &= \pi_1 - \frac{\lambda}{\alpha + \lambda} \cdot (B_1 + K_1) \\ \Pi_2 &= \pi_2 - \frac{\lambda}{\alpha + \lambda} \cdot (B_2 + K_2)\end{aligned}\tag{31}$$

So that:

$$E(\Pi) = \int_{\epsilon_1^-}^{\epsilon_1^+} \left[\Pi_1 + \delta \cdot \int_{\epsilon_2^-}^{\epsilon_2^+} \Pi_2 \cdot g(\epsilon_2|\epsilon_1) \cdot d\epsilon_2 \right] \cdot g(\epsilon_1) \cdot d\epsilon_1\tag{32}$$

Rearranging terms, it yields:

$$\begin{aligned}E(\Pi) &= \int_{\epsilon_1^-}^{\epsilon_1^+} \left\{ \pi_1 - \frac{\lambda}{\alpha + \lambda} \cdot K_1 \right. \\ &\quad \left. + \delta \cdot \int_{\epsilon_2^-}^{\epsilon_2^+} \left[\pi_2 - \frac{\lambda}{\alpha + \lambda} \cdot K_2 \right] \cdot g(\epsilon_2|\epsilon_1) \cdot d\epsilon_2 - \frac{\lambda}{\alpha + \lambda} \cdot \Omega(\epsilon_1) \right\} \cdot g(\epsilon_1) \cdot d\epsilon_1\end{aligned}\tag{33}$$

The objective of the MNE over the two period can thus be written as follows:

$$\left\{ \begin{array}{l} \text{Max}_{r_1(\epsilon_1), r_2(\epsilon_2), \Omega(\epsilon_1)} E(\Pi) \\ \text{s.c. : } \frac{d\Omega(\epsilon_1)}{d\epsilon_1} = -K'(r_1(\epsilon_1)) + \int_{\epsilon_2^-}^{\epsilon_2^+} K'(r_2(\epsilon_1, \epsilon_2)) \cdot \frac{\partial G_2(\epsilon_2|\epsilon_1)}{\partial \epsilon_1} \cdot d\epsilon_2 \quad (IC_1^1) \\ \frac{dB_2(\epsilon_2)}{d\epsilon_2} = -K_r(r_2(\epsilon_2)) \quad (IC_1^2) \\ \frac{dr_1(\epsilon_1)}{d\epsilon_1} < 1 \quad (IC_2) \\ \frac{dr_2(\epsilon_2)}{d\epsilon_2} < 1 \quad (IC_2) \\ \Omega_1(\epsilon_1^+) = 0 \quad (IR_1) \\ B_2(\epsilon_2^+) = 0 \quad (IR_2) \end{array} \right. \tag{34}$$

Proposition 3 *The optimal dynamic FDI strategy of a MNE operating in a country with weak institutions depends on the stability of the internal corruption pressure:*

i) *with time-invariable internal corruption pressure, asymmetry of information remains stable and the optimal dynamic FDI strategy entails a MNE commitment to*

a repetition of the static optimal FDI strategy: at each period, internal improvement of institution effectiveness is traded off with a reduction of oligopolistic competition.

ii) with time-variable internal corruption pressure, asymmetry of information is variable and a MNE commitment to a dynamic FDI strategy is impossible: internal improvement of institution effectiveness is an increasing function of the level of asymmetry of information between the MNE and the TB at the beginning of each period. The only implementable self enforcing contract is a static contract signed at the beginning of each period.

Proof.

When the MNE decides to access gradually the foreign market with weak institutions, the sequence is of optimal level of FDI $I(\epsilon)$ is given by:

$$I_1(\epsilon_1) = \frac{1}{\alpha + \lambda} \cdot \left[K(r_1(\epsilon_1)) + \int_{\epsilon_1}^{\epsilon_1^+} K'(r_1(\epsilon_1)) \cdot d\epsilon_1 \right] \quad (35)$$

$$I_2(\epsilon_1, \epsilon_2) = \frac{1}{\alpha + \lambda} \cdot \left[K(r_2(\epsilon_2)) + \int_{\epsilon_2}^{\epsilon_2^+} K'(r_2(\epsilon_2)) \cdot d\epsilon_2 \right] \quad (36)$$

and the optimal levels r_1, r_2 are given by:

$$\begin{aligned} \left[-\pi_y \cdot \frac{dy}{dr_1} \right] \cdot g_1(\epsilon_1) - \left[-C_r - \frac{\lambda}{\alpha + \lambda} \cdot K_r \right] \cdot g_1(\epsilon_1) \\ = \frac{\lambda}{\alpha + \lambda} \cdot G_1(\epsilon_1) \cdot \frac{d}{dr} \left[-\frac{dB_1(\epsilon_1)}{d\epsilon_1} \right] \quad (37) \end{aligned}$$

$$\begin{aligned} \left[-\pi_y \cdot \frac{dy}{dr_2} \right] \cdot g_1(\epsilon_1) - \left[-C_r - \frac{\lambda}{\alpha + \lambda} \cdot K_r \right] \cdot g_1(\epsilon_1) \\ = \frac{\lambda}{\alpha + \lambda} \cdot G_1(\epsilon_1) \cdot \frac{\partial G_2(\epsilon_2|\epsilon_1)/\partial\epsilon_1}{g_2(\epsilon_2|\epsilon_1)} \cdot \frac{d}{dr} \left[-\frac{dB_2(\epsilon_2)}{d\epsilon_2} \right] \quad (38) \end{aligned}$$

■

Proposition 2 is important to understand the role of centralization in corruption. When corruption is centralized, internal corruption pressures are known and predictable by the top bureaucrat. Even if they are private information, the Revelation Principle works fully and optimality is reached in each period. When corruption is decentralized i.e. when the top bureaucrat

is unable to know or to predict it, asymmetry of information disappears between the MNE and the TB. An informal intertemporal contract based on the Revelation Principle cannot work because it is based on the asymmetry of information. Decentralization of corruption entails thus a renegotiation of each contract at every beginning of the period when information is available to the top bureaucrat.

When the corruption pressure is stable, the MNE expects to stay in the country if it has been selected at the beginning of the period by the top bureaucrat and the corruption environment doesn't change. It is in the interest of both the MNE and the TB to replicate the one period relationship.

When the corruption pressure is changing and non-predictable, a new one-period contract is negotiated at the beginning of each period. This leaves room to changes in the selection of the MNE which cannot expect surely to stay in the country. Unstable corruption pressure will thus have an indirect ratcheted effect from the MNE which plans that its presence on the market can be jeopardized at the beginning of each period.

Durable presence on the market cannot be expected if internal corruption pressure cannot be centralized. The direct effect is to prevent long term relationship building because future cannot be predicted. Stability is a function of predictability which is a function of the durability of relationships.

3 Conclusion.

Weak institutions seems to be an impediment to FDI. An insecure environment deters foreign firms to invest abroad because of a lack of property rights enforcement. It is however not in the interest of local bureaucracy to keep out foreign firms: rent seeking through the capture of a part of foreign firms profit incites local TBs to trade access to their market in exchange of bribes. It is also in the foreign firms interest to have a restricted access to such markets and thus to bribe local decision makers: a limited access allows them to secure their rent shifting effect in the oligopolistic game with their competitors. The game opposing the local oligarchy to foreign investors is a non zero-sum game: each side is incited to do business with the other side. The problem is to divide the pie in this game. Bribes induces local TBs to respect the informal

agreement about the restriction over the access of the market. Thus, even if the MNE present in the market can use its experience to reduce the bribing cost, it won't be incited to use it. Reducing the bribe will induce the local TB to lower its restriction to its market and this will effect a reduction of the oligopolistic rent shifting effect. This analysis didn't take into account that local authoritys are incited to organize a competition among foreign investors in order to maximize the level of the bribes. However once the foreign investor is selected, the relationship remains the same and adding the stage of selection of the foreign investor doesn't bring more information with the cost of complicating the analysis. This paper points out that fostering competition in the field of foreign direct investment can only be reached by taking into account the informal property rights over market access owned by oligarchies in countries with weak institutions.

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